

REMARKS

The Examiner has issued a restriction requirement alleging that the application claims three distinct species directed to Figures 1-3 (Species 1); Figure 5 (Species 2); and Figure 7 (Species 3). The Examiner requests the Applicant to elect a single species. The Examiner indicates in the Restriction that no species is considered generic.

The Examiner's restriction is considered unclear by Applicants since the Examiner fails to identify the particular features of the invention shown in Figures 1-3, Figure 5 and Figure 7 respectively which thus render these figures representative of different species. In the absence of such explanation, Applicant does not know the basis for the Examiner's restriction.

In order to properly respond to the Examiner, Applicant identifies which claims Applicant considers to be generic and identifies sets of claims directed to different species illustrated in the cited figures. Applicant, in view of this division of the claims, then elects a particular species for examination.

1. Generic Claims

Applicant submits that amended independent claims 1, 18 and 49 and new independent claim 57 are generic. These claims all specify devices which comprise

a substrate comprising voltage switchable dielectric material which renders the substrate conductive when a voltage is applied to the substrate above a threshold voltage value and renders the substrate resistive when voltage is applied to the substrate below the threshold voltage value.

Claims 1 and 18 specify that a current carrying formation is formed on a surface of the substrate. Claim 49 specifies a Jepson claim comprising circuitry. New claim 57 specifies that circuitry is formed on a surface of the substrate. Both the substrate as claimed and a current carrying formation such as circuitry is shown in Figures 1-3, 5, and 7.

Applicant notes that claims 2-7, 19-36, and new claims 51-56 and 58-61 all relate to further claimable features that may be incorporated into Figures 1-3, 5, and 7. Accordingly, Applicants believe that these claims are within the restriction requirement which the Examiner has asserted.

2. **Species 1: Vias**

Applicant submits that independent claim 10 and dependent claims 6, 11-14 are drawn to a first species illustrated in Figure 5 (also shown in Figure 7) where the device comprises a conductive via extending through the substrate between opposing sides of the substrate.

3. **Species 2: Multiple substrate devices**

Applicant submits that independent claims 15 and 37 and dependent claims 16-17 and 38-48 are drawn to a second species, illustrated in Figure 7, where the device comprises multiple substrates 710, 810 and 910 sandwiched together.

4. **Election**

Pursuant to 37 C.F.R. 1.142, Applicant elects Species 1 directed to the inclusion of vias in a substrate. Claims 15-17 and 37-48 which are drawn to multiple substrate devices (Species 2) are withdrawn as being directed to the non-elected species pursuant to 37 C.F.R. 1.142(b). However, Applicant reserves the right pursuant to 37 C.F.R. 1.141 to pursue claims to the non-elected species in this application in the event that a generic claim is found to be allowable.

Applicant also reserves the right pursuant to 35 U.S.C. 121 to file one or more divisional applications directed to the non-elected species during the pendency of the present application.

Attached hereto is a marked-up version of the changes made to the specification and claims by the current amendment. The attached page is captioned "**Version with markings to show changes made.**"

CONCLUSION

Applicant earnestly believes that he is entitled to a letters patent, and respectfully solicit the Examiner to expedite prosecution of this patent application to issuance. Should the Examiner have any questions, the Examiner is encouraged to telephone the undersigned.

Respectfully submitted,

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VERSION WITH MARKINGS TO SHOW CHANGES MADE

Claims 15-17 and 37-48 have been cancelled.

Claims 1, 6-10, 18-20, 26-32, 49, and 50 have been amended as follows:

1. (Amended) A device comprising:

a substrate comprising [a] voltage switchable dielectric material which renders the substrate conductive when a voltage is applied to the substrate above a threshold voltage value and renders the substrate resistive when voltage is applied to the substrate below the threshold voltage value; and

a current carrying formation formed on [a plurality of selected sections of] a first surface of the substrate, the current carrying formation being in electrical communication with the substrate when a voltage is applied to the substrate above the threshold voltage value.

6. (Amended) The device of claim 1, wherein [the surface of] the substrate includes one or more vias extending from the first surface of the substrate through the substrate to a second, opposing side of the substrate, [the current carrying formation also being formed on] a surface of the substrate defining the vias comprising current carrying material in electrical communication with [so that] the current carrying formation on the first surface of the substrate such that the current carrying formation on the first surface is electrically contactable via the current carrying material within the vias from [an] the second opposing surface of the substrate.

7. (Amended) The device of claim 1, wherein the current carrying formation includes a plurality of current carrying elements separated from each other by a plurality of gaps, the plurality of gaps defining selected regions where a non-conductive layer was formed on the first surface of the substrate.

8. (Amended) The device of claim 1, further comprising a non-conductive layer on the first surface of the substrate, the non-conductive layer having gaps which do not cover regions of the first surface of the substrate, [corresponding to the plurality of selected sections where] the

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current carrying formation [is formed] being positioned in the regions of the first surface of the substrate not covered by the non-conductive layer.

10. (Amended) A device comprising:

a substrate comprising [a] voltage switchable dielectric material which renders the substrate conductive when a voltage is applied to the substrate above a threshold voltage value and renders the substrate resistive when voltage is applied to the substrate below the threshold voltage value, the substrate having a first surface and a second surface opposing the first surface, the substrate further including [a] one or more vias extending through the substrate between the first and second surfaces;

a current carrying formation formed on [a plurality of selected sections of the first and second surfaces] the first surface, a current carrying formation formed on the second surface, and current carrying material [on a surface of the substrate defining] within the one or more vias [to extend an electrical connection from the first surface to the second surface] which place the current carrying formations on the first and second surfaces in electrical communication with each other, the current carrying formations on the first and second surfaces being in electrical communication with the substrate when a voltage is applied to the substrate above the threshold voltage value.

18. (Amended) A device comprising:

a substrate comprising [a] voltage switchable dielectric material which renders the substrate conductive when a voltage is applied to the substrate above a threshold voltage value and renders the substrate resistive when voltage is applied to the substrate below the threshold voltage value; and

a current carrying formation formed on [a plurality of selected sections of] a first surface of the substrate, the current carrying formation being formed [on the surface of the substrate] by a process that includes contacting the substrate with a current carrying formation precursor while applying a voltage to the substrate [that is sufficient to cause the substrate to be conductive] above the threshold voltage value such that the substrate is conductive.

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19. (Amended) The device of claim 18, wherein the current carrying formation includes a plurality of current carrying elements separated from each other by a plurality of gaps, the plurality of gaps defining selected regions where a non-conductive layer was formed on the first surface of the substrate.
20. (Amended) The device of claim 19, wherein the non-conductive layer was formed from a photo-imageable material that was imaged to define the selected sections of the first surface of the substrate, and then subsequently removed from the substrate.
26. (Amended) The device of claim 18, wherein [a minimum voltage needed to cause the substrate to be conductive ranges] the threshold voltage value for the substrate is between 10 volts and 300 volts.
27. (Amended) The device of claim 18, wherein [a minimum voltage needed to cause the substrate to be conductive ranges] the threshold voltage value for the substrate is between 30 volts and 100 volts.
28. (Amended) The device of claim 18, wherein [the surface of] the substrate includes [a] one or more vias extending from the first surface of the substrate through the substrate to a second, opposing side of the substrate, [a current carrying formation being formed on] a surface of the substrate defining the vias comprising current carrying material in electrical communication with [,the current carrying layer being formed by contacting the surface defining the vias with a current carrying formation precursor while applying a voltage to the substrate that is sufficient to cause the substrate to be conductive] the current carrying formation on the first surface of the substrate such that the current carrying formation on the first surface is electrically contactable via the current carrying material within the vias from the second opposing surface of the substrate.
29. (Amended) The device of claim 28, wherein the current carrying [layer] material within the vias is formed [on the surface defining the vias during the process that forms the current carrying formation on the substrate] by a process comprising rendering the substrate conductive.

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30. (Amended) The device of claim 28, wherein the current carrying [layer] material within the vias is formed [on the surface defining the vias during] by a process that includes using an electrode to plate the current carrying formation on the [selected sections] first surface of the substrate while a voltage is applied to the substrate that is sufficient to cause the substrate to be conductive.

31. (Amended) A device comprising:

a substrate comprising [a] voltage switchable dielectric material which renders the substrate conductive when a voltage is applied to the substrate above a threshold voltage value and renders the substrate resistive when voltage is applied to the substrate below the threshold voltage value, the substrate having a first surface and a second surface opposing the first surface, the substrate further including [a vias that extends between a first surface and a second surface of the substrate] one or more vias extending through the substrate between the first and second surfaces; and

a current carrying formation formed on [a plurality of selected sections of the first and second surfaces] the first surface, a current carrying formation formed on the second surface, and current carrying material [on a surface of the substrate defining] within the one or more vias, the current carrying formation being formed [on the substrate] by one or more processes [, each process including] which include contacting the substrate with a current carrying formation precursor while applying a voltage to the substrate that is sufficient to cause the substrate to be conductive.

32. (Amended) The device of claim 31, wherein [a first current carrying formation on the first surface and a second current carrying formation on the second surface of the substrate each] the current carrying formations on the first and second surfaces of the substrate include a plurality of current carrying elements separated by a plurality of gaps, the plurality of gaps on each of the first and second surfaces defining selected regions where a corresponding non-conductive layer was formed.

49. (Amended) A semiconductor device including a substrate upon which circuitry forming the functionality of the semiconductor device is positioned, wherein the improvement comprises:

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a substrate comprising [a] voltage switchable dielectric material which renders the substrate conductive and in electrical communication with the circuitry when a voltage is applied to the substrate above a threshold voltage value and renders the substrate resistive when voltage is applied to the substrate below the threshold voltage value. [; and

a current carrying formation formed on a plurality of selected sections of a surface of the substrate.]

50. (Amended) The semiconductor device of claim [45] 49, wherein the semiconductor device [includes devices] is selected from a group consisting of integrated circuit devices, computer processors, computer readable memory devices, motherboards, and PCB.